



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

AgriPro Biosciences Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE
Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS (2) OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS OF THE OWNER OF THE RIGHTS. (34 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT

'Dalen'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this 29th day of October in the year of our Lord one thousand nine hundred and ninety-three.

Attest

Kenneth H. Evans
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Mike Egan
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

FORM APPROVED: OMB NO. 0581-0055

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions on reverse)

1. NAME OF APPLICANT(S) AgriPro Biosciences Inc.		2. TEMPORARY DESIGNATION N86-0903		3. VARIETY NAME Dalen	
4. ADDRESS (Street and No. or R.F.D. No., City, State, and Zip Code) 6700 Antioch Shawnee Mission, Kansas 66204		5. PHONE (Include area code) 913-384-4940 (KS) 303-532-3721 (CO)		FOR OFFICIAL USE ONLY PVPO NUMBER 9100197	
6. GENUS AND SPECIES NAME <u>Triticum aestivum</u>		7. FAMILY NAME (Botanical) Gramineae		FILING DATE June 17, 1991 TIME <input type="checkbox"/> A.M. <input type="checkbox"/> P.M.	
8. KIND NAME Hard Red Spring Wheat		9. DATE OF DETERMINATION 1) 1986 2) 1988 - July, Sept 1988 <i>AAA</i> <i>per letter</i>		AMOUNT FOR FILING \$ 2150. ⁰⁰ DATE June 11, 1991	
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (partnership, association, etc.) Corporation				AMOUNT FOR CERTIFICATE \$ 250. ⁰⁰ DATE Sept. 30, 1993	
11. IF INCORPORATED, GIVE STATE OF INCORPORATION Delaware				12. DATE OF INCORPORATION February 10, 1989	
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS					
R.E. Heiner 6700 Antioch Shawnee Mission, KS 66204 913-384-4940		OR C. Bruns or R.F. Bruns P.O. Box 30 Berthoud, CO 80513 PHONE (Include area code): 303-532-3721			

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED

- a. Exhibit A, Origin and Breeding History of the Variety (See Section 52 of the Plant Variety Protection Act.)
- b. Exhibit B, Novelty Statement.
- c. Exhibit C, Objective Description of Variety (Request form from Plant Variety Protection Office.)
- d. Exhibit D, Additional Description of Variety.
- e. Exhibit E, Statement of the Basis of Applicant's Ownership. **Exhibit F. Quality & Agronomic Data**

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act.) Yes (If "Yes," answer items 16 and 17 below) No

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? Yes No

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? Foundation Registered Certified

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.? Yes (If "Yes," give date) No

19. HAS THE VARIETY BEEN RELEASED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES? Yes (If "Yes," give names of countries and dates) No

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.
The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.
Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT <i>Robert E Heiner</i>	DATE May 29, 1991
SIGNATURE OF APPLICANT	DATE

EXHIBIT A.

ORIGIN AND BREEDING HISTORY OF DALEN

Dalen originated from the cross "HS80-401/PR2360" which was made at Berthoud, Colorado in 1982. Based upon short height, stem rust and leaf rust resistance selections were made from an F2 population of this cross at Berthoud in 1983. These selections were advanced in the greenhouse through the F4 generation by single seed descent. The original bulk was from an F5 head-row selection made at Climax, Minnesota in 1984. The selection criteria at this stage was short height, early maturity, rust resistance and foliar disease resistance. This bulk was increased at Berthoud in 1985 and entered into yield trials in 1986 under the experimental designation "N86-0903".

Dalen has been yield tested in AgriPro nurseries in the Red River Valley from 1986 to 1990. It has also been tested in the Northern Uniform Regional Nursery in 1989 and 1990.

In 1988, 60 head-rows were grown in Berthoud, Colorado. Fifty-two of these head-rows were selected for harvest and advanced to a .2 acre breeder seed increase that was planted in New Zealand in the fall of 1988. In the spring of 1989 a four acre breeder seed increase was planted in Berthoud, Colorado which produced an additional 6,950 pounds of breeder seed.

Dalen has been uniform and stable since 1990 as observed in foundation and registered production. Less than 0.5% of the plants were rogued from the breeder seed field in 1989. Approximately 90% of these rogued variant plants were three to ten centimeters taller than Dalen. Up to 1% total variant plants may be encountered in subsequent generations.

EXHIBIT B.**NOVELTY STATEMENT**

Dalen is most similar to the hard red spring wheat Len. However, it can be easily distinguished by the following morphological characteristics:

- Both Dalen and Len have acuminate beaks, but Dalen has a much shorter acuminate beak than Len, (see statistical data on page 1).
- Dalen has a square to round shoulder shape on the glume. Len has an oblique shoulder shape.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, MEAT, GRAIN & SEED DIVISION
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (TRITICUM SPP.)

INSTRUCTIONS: See Reverse.

NAME OF APPLICANT(S) AgriPro Biosciences Inc. ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code) 6700 Antioch Shawnee Mission Kansas, 66204	FOR OFFICIAL USE ONLY
	PVPO NUMBER 9100197 VARIETY NAME OR TEMPORARY DESIGNATION

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. 0 8 9 or 0 9) when number is either 99 or less or 9 or less.

1. KIND:

1 1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2. TYPE:

1 1 = SPRING 2 = WINTER 3 = OTHER (Specify) _____ 2 1 = SOFT 3 = OTHER (Specify)
2 2 = HARD

2 1 = WHITE 2 = RED 3 = OTHER (Specify) _____

3. SEASON - NUMBER OF DAYS FROM _____ TO:
planting

0 5 0 FIRST FLOWERING 0 5 5 LAST FLOWERING

4. MATURITY (50% Flowering):

0 2 NO. OF DAYS EARLIER THAN 7 1 = ARTHUR 2 = SCOUT 3 = CHRIS
--- NO. OF DAYS LATER THAN 4 = LEMHI 5 = NUGAINES 6 = LEEDS 7 = Len

5. PLANT HEIGHT (From soil level to top of head):

0 8 0 CM. HIGH
--- CM. TALLER THAN
0 2 CM. SHORTER THAN 7 1 = ARTHUR 2 = SCOUT 3 = CHRIS
4 = LEMHI 5 = NUGAINES 6 = LEEDS 7 = Len

6. PLANT COLOR AT BOOTING (See reverse):

3 1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTHUR COLOR:

1 1 = YELLOW 2 = PURPLE

8. STEM:

1 Anthocyanin: 1 = ABSENT 2 = PRESENT 2 Waxy bloom: 1 = ABSENT 2 = PRESENT
2 Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT 1 Internodes: 1 = HOLLOW 2 = SOLID
0 5 NO. OF NODES (Originating from node above ground) 2 1 CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:

2 Anthocyanin: 1 = ABSENT 2 = PRESENT 2 Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:

2 Flag leaf at booting stage: 1 = ERECT 2 = RECURVED 2 Flag leaf: 1 = NOT TWISTED 2 = TWISTED
3 = OTHER (Specify): _____ 2 Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT
1 Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT 1 1 MM. LEAF WIDTH (First leaf below flag leaf) 1 9 CM. LEAF LENGTH (First leaf below flag leaf)

4

FORM GP-470-6 (REVERSE)

11. HEAD:

3 Density: 1 = LAX 2 = DENSE 3 = middense 2-1 Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE 4 = OTHER (Specify) _____

4 Awnedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED

1 Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED 5 = BROWN 6 = BLACK 7 = OTHER (Specify): _____

0 9 CM. LENGTH 1 0 MM. WIDTH

12. GLUMES AT MATURITY:

2 Length: 1 = SHORT (CA. 7 mm.) 2 = MEDIUM (CA. 8 mm.) 3 = LONG (CA. 9 mm.) 2 Width: 1 = NARROW (CA. 3 mm.) 2 = MEDIUM (CA. 3.5 mm.) 3 = WIDE (CA. 4 mm.)

4-3 Shoulder shape: 1 = WANTING 2 = OBLIQUE 3 = ROUNDED 4 = SQUARE 5 = ELEVATED 6 = APICULATE 3 Beak: 1 = OBTUSE 2 = ACUTE 3 = ACUMINATE

13. COLEOPTILE COLOR:

1 1 = WHITE 2 = RED 3 = PURPLE

14. SEEDLING ANTHOCYANIN:

2 1 = ABSENT 2 = PRESENT

15. JUVENILE PLANT GROWTH HABIT:

2-3 1 = PROSTRATE 2 = SEMI-ERECT 3 = ERECT

16. SEED:

1-3 Shape: 1 = OVATE 2 = OVAL 3 = ELLIPTICAL 2 Cheek: 1 = ROUNDED 2 = ANGULAR

2-3 Brush: 1 = SHORT 2 = MEDIUM 3 = LONG 1 Brush: 1 = NOT COLLARED 2 = COLLARED

--- Phenol reaction (See instructions): 1 = IVORY 2 = FAWN 3 = LT. BROWN 4 = BROWN 5 = BLACK

3 Color: 1 = WHITE 2 = AMBER 3 = RED 4 = PURPLE 5 = OTHER (Specify) _____

6.2 MM. LENGTH 3.0 MM. WIDTH 3.3 GM. PER 1000 SEEDS

17. SEED CREASE:

1-2 Width: 1 = 60% OR LESS OF KERNEL 'WINOKA' 2 = 80% OR LESS OF KERNEL 'CHRIS' 3 = NEARLY AS WIDE AS KERNEL 'LEMHI' 1-2 Depth: 1 = 20% OR LESS OF KERNEL 'SCOUT' 2 = 35% OR LESS OF KERNEL 'CHRIS' 3 = 50% OR LESS OF KERNEL 'LEMHI'

18. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant) 3 = Moderately Susceptible 4 = Moderately Resistant

2 STEM RUST (Races) Field races 4 LEAF RUST (Races) Field races 0 STRIPE RUST (Races) 0 LOOSE SMUT

0 POWDERY MILDEW 0 BUNT 0 OTHER (Specify) _____

19. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant) 3 = Moderately Susceptible 4 = Moderately Resistant

0 SAWFLY 0 APHID (Synov.) 0 GREEN BUG 0 CEREAL LEAF BEETLE

0 OTHER (Specify) _____ HESSIAN FLY RACES: 0 A 0 B 0 C 0 D 0 E 0 F 0 G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	len	Seed size	len
Leaf size	len	Seed shape	len
Leaf color	Celtic	Coleoptile elongation	len
Leaf carriage	len	Seedling pigmentation	len

INSTRUCTIONS

GENERAL: The following publications may be used as a reference aid for the standardization of terms and procedures for completing this form:

- (a) L.T. Briggie and L. P. Reitz, 1964, Classification of *Triticum* Species and Their Varieties Grown in the United States, Technical Bulletin 1278, United States Department of Agriculture.
- (b) T.E. Walls, 1965, A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity, contribution No. 29 to the handbook of seed testing prepared by the Association of Official Seed Analysts. (See attachment.)

LEAF COLOR: Nickerson's or any recognized color fan should be used to determine the leaf color of the described variety.

EXHIBIT D.**ADDITIONAL BOTANICAL DESCRIPTION OF DALEN**

Dalen is a hard red spring wheat bred and developed by AgriPro Biosciences Inc. This variety is a high yielding, intermediate height semidwarf with excellent test weight levels. It has early maturity and strong straw. Dalen has very good protection to stem and leaf rust. Dalen has satisfactory milling and baking properties with medium-high protein levels.

Juvenile growth habit is erect to semi-erect. Plant color at boot stage is blue green with a recurved, twisted flag leaf. Auricle hairs and anthocyanin are present. Waxy bloom is present on the stem, head and flag leaf sheath. Head shape is strap to tapering, middense, awned and white at maturity. Glumes are midlong and midwide with square to round shoulders and acuminate beaks. Seed shape is ovate to elliptical with angular cheeks and midlong to long brush hairs. Seed crease is narrow to midwide and depth is shallow to middeep.

Dalen is adapted to the entire northern spring wheat region. This includes the states of North Dakota, South Dakota and Minnesota.

EXHIBIT E.**STATEMENT OF THE BASIS OF APPLICANT'S OWNERSHIP**

AgriPro Biosciences Inc. is the applicant for protection in this case being:

- a) The incorporated business (registered in Delaware) for and within which regular employees have bred the named variety.
- b) The proprietary owner and intending commercial user of the variety.

EXHIBIT F.

QUALITY AND AGRONOMIC DATA

Quality Datapage 1.
Stem and Leaf Rust Ratingspage 2.
Red River Valley Trial Summarypage 3.
Trial Summary Data Dalen vs. Bergenpage 4.
Trial Summary Data Dalen vs. Butte 86page 5.
Trial Summary Data Dalen vs. Stoapage 6.

9100197

AgriPro Seeds
 HARD RED SPRING WHEAT TRIAL SUMMARY
 OVER LOCATIONS-OVER YEARS
 APRIL 14, 1993

YEARS: 89 90 91 92

VARIETIES: DALEN

BUTTE 86

AREA	LOCS	YIELD Bu/Ac		T.WT. lb/Bu			HEAD Days			HEIGHT cm.			LODGE (1-9)		
		DALEN	BUTTE	LOCS	DALEN	BUTTE	LOCS	DALEN	BUTTE	LOCS	DALEN	BUTTE	LOCS	DALEN	BUTTE
RR	28	61.5	59.7	25	60.5	60.6	21	54.0	53.2	10	73.8	79.6	8	2.8	3.8
W	38	43.4	41.5	38	59.5	59.6	19	59.0	58.6	32	70.5	82.6	1	1.0	0.0
NE	15	57.2	56.3	13	60.3	59.9	8	58.5	57.9	9	73.7	83.3	3	2.3	2.7
SE	30	44.7	44.5	30	56.8	57.7	19	56.0	54.6	27	74.3	84.2	8	2.4	3.0
CN	2	65.9	67.2	0	0.0	0.0	0	0.0	0.0	2	71.0	83.0	2	1.0	1.0
MN	23	55.5	53.5	22	58.9	59.1	22	53.6	52.3	14	75.6	80.6	11	3.5	3.9
MT	3	31.3	29.4	3	55.0	56.0	3	60.7	60.7	3	70.0	81.0	1	1.0	0.0
ND	50	54.2	52.3	48	61.0	60.8	27	58.2	57.6	29	70.6	81.3	5	1.0	2.8
SD	33	41.3	41.3	33	56.7	57.7	15	56.9	56.1	30	73.6	85.7	1	2.0	3.0
ALL	111	50.2	48.9	106	59.1	59.3	67	56.5	55.7	78	72.6	82.9	20	2.5	3.1

ANOVA TABLE FOR BEAK LENGTH

DALEN vs. LEN

THE FOLLOWING RESULTS ARE FOR:

	VAR	=	1.000 (Dalen)
TOTAL OBSERVATIONS:	25		
	VAR		BEAKLENGTH
N OF CASES	25		25
MINIMUM	1.000		2.000
MAXIMUM	1.000		4.700
MEAN	1.000		3.172
STANDARD DEV	0.000		0.613

THE FOLLOWING RESULTS ARE FOR:

	VAR	=	2.000 (Len)
TOTAL OBSERVATIONS:	25		
	VAR		BEAKLENGTH
N OF CASES	25		25
MINIMUM	2.000		4.700
MAXIMUM	2.000		10.200
MEAN	2.000		6.464
DEP VAR:BEAKLENG	N:	50	MULTIPLE R: 0.357
SQUARED MULTIPLE R:			0.127

SOURCE	SUM-OF-SQUARES	ANALYSIS OF VARIANCE		F-RATIO	P
		DF	MEAN-SQUARE		
REGRESSION	5.578	1	5.578	6.997	0.011
RESIDUAL	38.264	48	0.797		

ACRIPRO WHEAT
HARD RED SPRING WHEAT

YEAR: 1990

FLOUR/WHEAT QUALITY

YEAR	VARIETY OR LINE	LOC	TEST WT	WHT PROT	FIR PROT	FIR YLD	FIR %	ASH	MIXOGRAM			TOL	ABS %	MIX TIME	LOAF VOL	CRUMB			OVER ALL				
									14%mb	14%mb	R					PK	PK	HT		mm	R	CR	TX
90	DALEN	BP	62.3	13.8	12.1	4	111	71.8	.435	3.25	5.8	1229	5	66.0	4	3.25	3	1050	5	3	2	2	43
90	DALEN	ST	61.8	14.4	12.6	5	107	72.2	.487	3.25	5.5	1177	4	65.0	5	3.25	3	1080	4	3	2	2	42
90	DALEN	TM	63.7	13.5	12.2	4	95	75.6	.492	3.00	5.3	1369	3	67.0	4	3.00	1	1000	5	3	2	2	37
89	DALEN	CX	63.2	14.2	12.8	4	100	71.2	.385	4.25	5.8	854	7	67.0	3	4.25	1	1120	4	4	2	3	45
89	DALEN	ST	62.3	14.8	13.1	4	91	72.2	.407	3.75	5.5	516	6	67.0	4	3.75	3	910	8	4	3	2	51
89	DALEN	BP	63.1	15.7	13.9	3	101	69.6	.405	3.25	5.8	534	6	69.0	3	3.25	3	1190	3	3	3	2	44
89	DALEN	TM	63.1	15.0	13.3	3	111	70.3	.414	4.25	5.3	1124	5	68.0	2	4.25	1	1220	2	4	3	2	39
87	DALEN	CS	60.4	13.1	11.1	5	00	71.3	.000	2.75	5.0	1320	3	63.0	4	2.75	5	1000	6	4	3	3	50
87	DALEN	TM	63.1	13.6	12.8	3	00	71.0	.000	2.75	5.7	880	5	65.0	2	2.75	5	1200	1	5	3	3	43
AVERAGE			62.6	14.2	12.7	4	102	71.7	.432	3.39	5.5	1000	5	66.3	3	3.39	3	1086	4	4	3	2	44

90	LEN	BP	58.9	14.1	12.8	3	90	72.2	.476	4.25	5.5	1556	3	67.0	3	4.25	3	1150	2	4	3	2	36
90	LEN	ST	61.3	14.8	13.5	3	101	72.9	.460	4.25	5.5	1142	4	67.0	3	4.25	3	1190	1	3	2	2	33
90	LEN	TM	62.3	14.3	13.5	1	83	75.1	.494	3.75	5.3	1251	4	69.0	2	3.75	3	1050	4	2	2	2	30
89	LEN	CX	62.1	14.4	13.2	3	90	71.3	.407	5.75	5.8	1307	3	68.0	2	5.75	5	1150	3	3	3	2	37
89	LEN	ST	60.9	15.1	13.7	3	93	72.8	.428	5.00	5.3	940	3	69.0	2	5.00	3	1120	3	5	3	2	38
89	LEN	BP	61.2	15.3	13.9	3	90	72.3	.453	4.75	5.3	863	3	70.0	2	4.75	3	1230	2	4	3	2	35
89	LEN	TM	60.9	15.2	13.7	2	83	72.2	.476	4.75	5.5	1024	6	69.0	1	4.75	3	1160	4	5	3	2	42
87	LEN	CS	59.8	13.4	12.5	3	00	73.0	.000	3.50	5.0	1545	2	64.0	3	3.50	1	1000	6	5	4	4	42
87	LEN	TM	62.1	14.4	13.3	2	00	72.9	.000	3.50	6.0	1155	3	66.0	1	3.50	1	1150	2	4	3	3	30
AVERAGE			61.1	14.6	13.3	3	90	72.7	.456	4.39	5.5	1198	3	67.7	2	4.39	3	1133	3	4	3	2	36

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page 2.

STEM AND LEAF RUST RATINGS
CEREAL RUST NURSERY* 1989-1990

VARIETY	STEM RUST		LEAF RUST	
	1989	1990	1989	1990
Butte 86	TR	5MR	60S	5MR
Stoa	TR	TR	60MR-MS	10MR
Era	0	TR	5R-MR	TMR
Dalen	TR-MR	TR	20R-MR	TMR

*St. Paul, Minnesota - Uniform Regional Reports

SPRING WHEAT COMMERCIAL VARIETY TRIAL OVER-YEAR SUMMARY - 1987-90
 (AGRIPRO DATA ONLY FROM RED RIVER VALLEY)

VARIETY	YIELD DATA					3-YR AVG	% OF WTN	TEST.WT. LBS/BU	HD AVE	LEAF RUST						STEM R.						PROT AVE
	87(5)	89(4)	90(3)	90						89		90		89		90		89		90		
				88(3)	89(4)					R	S	R	S	R	S	R	S	R	S	R	S	
BERGEN	72.6	69.0	71.4	71.1	103	60.4	4.6	2	2	2	1	1	2	2	2	2	2	2	2	13.3		
NORDIC	72.5	68.2	70.8	70.6	102	61.9	5.9	5	5	4	5	5	3	2	2	2	2	2	2	12.5		
DALEN	71.7	67.4	71.9	70.3	101	61.8	4.4	1	1	2	2	2	4	3	3	3	3	3	3	14.1		
WHEATON	70.6	69.2	67.4	69.3	100	59.8	5.4	2	3	2	3	2	3	3	3	3	3	3	3	13.1		
FJELD	68.2	64.8	72.2	68.1	98	61.0	4.6	2	4	5	4	5	4	4	4	4	4	4	4	13.2		
NORSEMAN	68.1	67.9	68.1	68.0	98	59.4	5.8	2	2	2	2	3	4	3	4	3	4	3	3	13.4		
2375*	--	67.1	68.7	67.6	98	61.7	3.8	2	2	2	--	--	3	2	3	2	3	2	2	13.9		
MARSHALL	66.3	68.7	66.5	67.2	97	60.9	5.9	2	2	2	2	3	4	5	4	5	5	5	5	13.1		
STOA	66.5	65.4	65.1	65.8	95	61.3	4.5	3	3	3	2	2	3	3	3	3	3	3	3	14.4		
ERA	63.4	68.6	65.2	65.6	95	60.8	6.5	2	2	2	2	3	3	2	3	2	3	2	2	12.7		
TELEMARK	64.5	65.7	66.6	65.4	94	59.3	4.9	3	2	4	4	4	4	4	6	6	4	4	6	14.2		
W2501*	69.4	--	67.2	65.3	94	58.6	5.0	--	--	--	--	--	--	--	--	--	--	--	--	12.8		
CELTIC	63.6	63.8	66.7	64.4	93	61.4	4.6	2	2	3	4	3	4	3	2	2	2	2	2	14.1		
VANCE*	--	65.5	63.2	64.3	93	59.9	5.9	2	2	2	2	2	2	2	2	2	2	2	2	13.8		
GUS*	--	63.2	64.5	63.6	92	60.9	4.6	4	4	4	2	2	2	2	2	2	2	2	2	14.7		
BUTTE 86	62.1	59.3	68.1	62.7	90	61.9	3.3	5	4	3	3	3	3	3	3	3	3	3	3	14.5		
LEN	63.0	62.4	62.0	62.6	90	60.9	5.4	2	2	2	2	2	2	2	2	2	2	2	2	14.5		
GRANDIN*	--	60.4	63.3	62.4	90	61.6	4.1	6	5	2	2	2	2	2	4	6	6	6	6	--		
MINNPRO*	--	62.3	61.4	61.7	89	59.1	5.4	2	2	2	2	2	2	2	2	2	2	2	2	14.5		
NO. OF LOC.	5.0	4.0	3.0	11.0		11.0	7.0													11.0		

* adjusted for averages

**SPRING WHEAT TRIAL SUMMARIES
OVER LOCATIONS-1989**

VARIETY OR LINE: DALEN VERSUS BERGEN

State	YIELD OVER LOCATION			State	TEST WT. OVER LOCATION		
	bu/a Dalen	bu/a Bergen	# Loc		lbs/bu Dalen	lbs/bu Bergen	# Loc
MN	56.0	54.5	5	MN	60.7	59.0	5
MT	26.4	24.6	1	MT	49.3	50.3	1
ND	46.3	47.6	7	ND	60.5	59.4	7
SD	39.7	37.1	5	SD	60.4	57.6	5

OVER LOCATION:

VARIETY	# LOC	YIELD	#Ave LOC	TW	#Ave LOC	Ht cm	#Ave Hd LOC	days
DALEN	18	46.0	18	59.9	16	70.6	18	53.9
BERGEN	18	45.3	18	58.3	16	68.3	18	56.3

**SPRING WHEAT TRIAL SUMMARIES
OVER LOCATIONS-1989**

VARIETY OR LINE: DALEN VERSUS BUTTE 86

State	YIELD OVER LOCATION			State	TEST WT. OVER LOCATION		
	bu/a Dalen	bu/a Butte86	# Loc		lbs/bu Dalen	lbs/bu Butte86	# Loc
MN	56.0	49.9	5	MN	60.7	60.3	5
MT	26.4	26.8	1	MT	49.3	52.0	1
ND	46.3	43.0	7	ND	60.5	60.1	7
SD	39.7	36.5	5	SD	60.4	59.6	5

OVER LOCATION:

VARIETY	# LOC	YIELD	#Ave LOC	TW	#Ave LOC	Ht cm	#Ave Hd LOC	days
DALEN	18	46.0	18	59.9	16	70.6	18	53.9
BUTTE 86	18	42.2	18	59.6	16	78.9	18	53.4

SPRING WHEAT TRIAL SUMMARIES
OVER LOCATIONS-1989

VARIETY OR LINE: DALEN VERSUS STOA

State	YIELD OVER LOCATION			State	TEST WT. OVER LOCATION		
	bu/a Dalen	bu/a Stoa	# Loc		lbs/bu Dalen	lbs/bu Stoa	# Loc
MN	56.0	54.3	5	MN	60.7	59.5	5
MT	26.4	26.5	1	MT	49.3	53.3	1
ND	46.3	45.6	7	ND	60.5	59.1	7
SD	39.7	37.5	5	SD	60.4	59.0	5

OVER LOCATION:

VARIETY	# LOC	YIELD	#Ave LOC	TW	#Ave LOC	Ht cm	#Ave Hd LOC	days
DALEN	18	46.0	18	59.9	16	70.6	18	53.9
STOA	18	44.7	18	58.9	16	83.0	18	55.7